Group Memory

Bridge Construction Forum

February 3, 2005

Next Meeting dates

Desired outcome for next meeting:

Bin List & Great Ideas

IDEA: Joint training. Industry and CT should get together to develop training for contractor staff- - English/ Spanish; work on the content together. Issue is experience level/training on both sides: CT & Industry. Industry should take the initiative, and CT will help. (see discussion notes outline # 5.)

Idea: Can use JIT training – so the contract calls out the training that is needed for the project.

Training Need pre-construction conference for certain situations –

Idea: Match contractor with inspector – weak contractor needs good inspector.

Idea: Some contractors make consultant who stamped the falsework plan do a field review; others do not. To level the playing field, the field review should require the designer to sign off on the falsework construction.

Idea: CT has talked about this issue for years – We need to share what is working to prevent accidents. Share other stories as well; then certify the people who attend the "training." Should be driven by industry, not required in spec. Industry needs to be proactive; otherwise the changes will be forced on the industry possibly by legislation, etc.

1.

Group Decisions

All decisions made will be double underlined in the body of the notes below.

1. (Date)

Document Register

1

Upshot

These are the assignments made at the meeting. As new ones are added they will be appended to the list. As assignments are completed they will be lined out with ~~a strike-through~~, but left on the list. This will provide a running record of assignments made at these meetings.

Ref. #	Who	What	When
1	Dolores	Put your presentation on the web site.	
2			

Ref. #	Who	What	When
3			
4			

Critique from this meeting:

What went well	What Needs Improvement
1.	1.

1. Ground rules:
    1. 1. one conversation at a time.
2. Opening Remarks
    2. 1. We have had to rely on a limited “virtual forum” over the last couple of years; we are happy to get going today again face to face.
    2. 2. Caltrans is here to listen.
    2. 3. This year we will not have any breakout groups. We will convene the entire meeting together.
3. Opening comments from group:
    3. 1. Need to use ASCE for distribution – local branches.
    3. 2. Put copies of the presentation on the web site. (see upshot # 1)
4. John Babcock – topic introduction
    4. 1. How can we prevent falsework failures? How can we keep the falsework up in the air?
    4. 2. There have been three accidents in the last several days.
    4. 3. How do we ensure column cages stay guyed?

Discussion from group:

5. Falsework manual –
    5. 1. linked to the standard specs only for bolting at this time.
    5. 2. Issue: There is a dichotomy between what is in the falsework manual and the actual practices in the field. It is a handy tool.
    5. 3. We need to work toward protecting our people, rather than cutting corners.
    5. 4. Real value of the falsework manual is that CT uses the manual to check what contractors do. It is what CT considers best practice. Good falsework designs will meet the requirements.

5. 5. Put as much as possible in the manual for those contractors who don't have engineers on staff. This is a valuable tool.

5. 6. More specs don't solve the problem when the person following the spec has no clue what they are reading.

5. 7. Consulting outside for all engineering work – One contractor makes sure the consultant will come out and sign off on the falsework before the pour. Superintendent and consultant make changes together, engineer signs off on it. We have to work at communicating. We also work with the same consultant most of the time, and have good relationship.

5. 8. Construction company could have their own engineer in-house.

6. Falsework training:

6. 1. IDEA: Joint training. Industry and CT should get together to develop training for contractor staff who are actually in the field. - - English/ Spanish; work on the content together. Issue is experience level/training on both sides: CT & Industry. Industry should take the initiative, and CT will help.

6. 2. Falsework Problems are almost never design problems. It is almost always a problem with execution. That is why CT seniors and staff are checking to ensure that what is on the plan is being done.

6. 3. Language problems often are a problem among the workforce if the foreman is not bilingual. In San Diego area, much of the workforce is Spanish for first language, and may not be bilingual.

6. 4. Training needs to be focused and delivered to the right people. Foreman who is not on the job may not need the training. Need to ensure the person in the field gets the training.

6. 5. Idea: Need pre-construction conference for certain situations –

6. 6. Idea: Can use JIT training – so the contract calls out the training that is needed for the project.

6. 7. Idea: Match contractor with inspector – weak contractor needs good inspector.

6. 8. Does contractor or consultant direct the field staff to the most critical areas of a falsework?

7. Quality control – how is it being done? Who polices within industry?

7. 1. It is not documented by foreman. You have to know your people. Experienced people need less guidance.

7. 2. Written internal procedures are used.

7. 3. QC effort needs to reflect the location and situation.

7. 4. Different contractors use different procedures.

7. 5. Certification of falsework is ethical issue.

7. 6. Idea: Some contractors make consultant who stamped the falsework plan do a field review; others do not. To level the playing field, the field review should require the designer to sign off on the falsework construction.

7. 7. Many of the accidents we are discussing today would not have been prevented by the design engineer's certification, or being at the location to certify the construction.

7. 8. We have to be careful about "quick fix band-aid approaches."

Topic Discussion – Falsework Grading and Jacking

8. How do we prevent roll-overs? How do we prevent the sill from moving?

8. 1. Hinge the side of the frame.

8. 2. Don't jack without filling immediately.

8. 3. Jacking note in plan: beef up the plan – max air gap is 2 inches, per my plans. In certain cases even 2 inches could be too much. Keep clearance within range where the jack has not rotated enough to fall over.

8. 4. Bottle jacks not too steady. Jack must be centered under the sill. Sometimes crew may not be aware they are not jacking up, but instead are rolling the sill over.

8. 5. Does crew need to be certified in proficiency? Is it a training issue?

8. 6. Jacking bracket can ensure the jack is placed properly.

8. 7. Lay out jacking spots.

8. 8. CT does not want to tie contractors' hands – but should there be a standard jacking system submitted with falsework design by each contractor?

8. 9. Templates for jacks could be built and used.

8. 10. If a spec is not made globally, it puts some contractors at a disadvantage. What ever is required from any should be required from all.

8. 11. CT has talked about this issue for years – We need to share what is working to prevent accidents. Share other stories as well; then certify the people who attend the "training." Should be driven by industry, not required in spec. Industry needs to be proactive; otherwise the changes will be forced on the industry possibly by legislation, etc.

8. 12. Maybe a jacking school before the crew goes out so the crew understands what is going on, and understands the implications.

8. 13. Educate the guy on the ground. Make sure the individuals doing the job are qualified.

8. 14. Always keep the wedges close behind.

8. 15. Hire a filming crew, interview John Jones; and other foremen – produce a CD ROM on their experiences, what to be careful about.

8. 16. Be careful about surveying and calculating – double check your numbers.

8. 17. Structures senior needs to give Bridge Construction Engineer a stern talk (Serious A/C) when job requires jacking that exceeds limit maybe 4 inches?) BCE needs to take personal responsibility for mistakes under his or her watch. Need to penalize – there are ways to do this…

8. 18. Use something in spec that require "Contractor should have grading plan" and include something in the falsework manual as a guide – something to shoot for.

8. 19. Something simple could be included as a standard plan – something very straight forward.

8. 20. Would be great if the falsework could be minimized.

8. 21. We used to do a better job of getting together before the job to agree on grading. Minimize the jacking.

8. 22. We need to check all the grades – Theoretically QC is contractor responsibility.

8. 23. Double check the post heights – don't tell the contractor what to do, but check. (In reality there is no time for this.)

8. 24. Make sure everyone is in the same place for bridge grade checking. CT has shot grades wrong – that is a big problem. When we submit the grades and confirm them, then CT will re-shoot from different benchmark or different hub and it makes a big difference.

8. 25. MINIMIZE jacking – know the elevation and where we are shooting – Get together on the grades before we go out and have a problem.

8. 26. Prefer to have CT shoot grades above posts.

8. 27. Need inspector who is respected. Foreman also… No knuckleheads. Need to communicate with each other.

8. 28. Maybe this is a conversation we need at partnering.

8. 29. Involve some of the foremen in the partnering.

8. 30. Pre-construction, tailgate, partnering – involve the right foremen and inspectors in the meetings.

8. 31. Be sure CT inspection team in involved with crew tailgate pre-construction, pre-operation and tailgate meetings.

8. 32. Caltrans needs to implement system where there is redundant system of shims and wedges to ensure minimal air gap.

9. **Topic Discussion – Falsework Erection and Removal** / Collaps during removals –

9. 1. CT and Contractors don't really understand the loads they are dealing with just erecting and removing materials. Timeclock constraint, rental cranes, different materials and materials issues – contribute.

9. 2. if rod has any deformation, strike, nick or anything in the way of imperfection, rod can fail.

9. 3. Need to be very careful not to overload winches. Winches can be supported on overhang. Cantilever not necessary.

9. 4. Stripping plan is required – generic plan is submitted – but by the time it comes to strip, the plan is not accurate. Pre-stripping procedure is written and a safety meeting is conducted. The procedure is signed by everyone. Tasks and work are identified by shift. This forces contractor/engineer to look at current configuration, traffic, time constraints, etc. just before stripping begins.

9. 5. How much detail should be required in the plan? (generic at the beginning.)

9. 6. How can CT assure contractor is doing the work safely?

9. 7. Some do not put things over the edge. We form a hole at the edge of the overhang.

9. 8. Engineer should be there on the job when the stripping job is going on.

9. 9. Can we secure things at the end of a shift so we can finish tomorrow? Can't let falsework sitting on a winch without a positive connection.

9. 10. Having a plan for stripping makes you do better falsework. It has to be stable going up and coming down; not just letting it crash down.

9. 11. CT is looking for something ***OTHER*** than "Take it down in reverse order from erection."

9. 12. Need to itemize the plan, piece by piece. Force the foreman and engineer to get together to figure out what will be done, step by step.

9. 13. During release, if span is long, with lot of camber, how many wedge packs are taken out? If bent has really long sill, bottom cap can buckle.

9. 14. Sand jacks are controversial – they can pop when you don't want them to. Load is extremely high.

9. 15. Think about what it will take to take it down, when you build it –

9. 16. Provide longer window for the contractor to strip the falsework.

9. 17. Soffit overlap causes problem.

9. 18. Provide the window to start an hour earlier if possible. Early start is big help.

9. 19. Do more work up front.

9. 20. Do more planning on how to remove.

9. 21. Before stripping operation, prepare detailed procedure in house.

9. 22. Check the posts to ensure they are sound.

9. 23. Stripping plan up front doesn't make much sense.

9. 24. Wood post loading – let the superintendent know what the actual loads are – have the crew know what the loads are – explain it to them.

9. 25. Caltrans reviews are not good because they don't know enough about the operation and the contractor. This should be addressed.

9. 26. CT should give examples of what acceptable plans look like.

9. 27. Need consistency from CT – what is acceptable.

9. 28. detailed stripping plans for the contractor are done for most jobs.

9. 29.

10. **Topic Discussion – Rebar Cage Construction and Guying Plans**

10. 1. Two barrel column – when it was picked, the center was pulled down a little bit – needed to attach slings in center.

10. 2. CT should tell the contractor how to do it. Since crane can't be in creek, on the bridge, or anywhere, why doesn't CT tell us how to do it?

10. 3. Designers need to be in field to realize what they are asking for.

10. 4. Cages are not as well supported as they used to be. We are seeing problems.

10. 5. Contractor knows weight and length – getting fewer and fewer situations where cage stands by itself.

10. 6. Could be a research project – do some modeling and synthesis in this area – we need more data, more information. We need more information. We need to understand how these cages behave during picking.

10. 7. Need to look at tying. Tie at every intersection – is it needed?

10. 8. Racking is a problem itself.

10. 9. Flag the falsework cables so they don't get hit. Open them up and tie ribbons on them so they can be seen. Increase visibility.

11. other comments

11. 1. Good idea to have rotation or job exchange program for CT & industry engineers so they can see more of each others' world.